

Claims

We claim:

- 1 1. A method for encoding multimedia to be transmitted on a channel,
2 comprising:
3 measuring a condition of the channel;
4 measuring rate and distortion characteristics of the multimedia;
5 providing a set of error resilient source encoding procedures;
6 providing a set of channel encoding procedures;
7 providing a set of transmitter power levels;
8 providing an objective function and a constraint based on energy
9 and distortion; and
10 selecting jointly a particular error resilient source encoding
11 procedure, a particular channel encoding procedure, and a particular power
12 level based on the condition of the channel and the rate and distortion
13 characteristics, while minimizing an objective function and satisfying a
14 constraint.
- 1 2. The method of claim 1, in which the objective function minimizes energy
2 while the constraint is a distortion.
- 1 3. The method of claim 1, in which the objective function minimizes
2 distortion while the constraint is energy.

1 4. The method of claim 1, further comprising:
2 applying the particular error resilient source encoding procedure to
3 the multimedia to produce a bit stream;
4 applying the particular channel encoding procedure to the bitstream
5 to produce an output signal; and
6 applying the particular power level to the output signal for
7 transmission.

1 5. The method of claim 1, in which the bitstream includes a plurality of
2 layers, and the selecting is performed independently for each layer.

1 6. The method of claim 1, in which the condition includes bandwidth.

1 7. The method of claim 1, in which the multimedia include JPEG 2000
2 images.

1 8. The method of claim 1, in which the multimedia include moving-JPEG
2 2000 videos.

1 9. The method of claim 1, in which the objective function is minimized and
2 the constraint is satisfied by analyzing an energy-distortion curve.

1 10. A system for encoding multimedia to be transmitted on a channel,
2 comprising:
3 means for measuring a condition of the channel;
4 means for measuring rate and distortion characteristics of the
5 multimedia;
6 joint source channel coding-power controller means for selecting
7 jointly an error resilient source encoding procedure, a channel encoding
8 procedure, and a power level based on the condition of the channel and the
9 rate and distortion characteristics, while minimizing an objective function
10 and satisfying a constraint;
11 a source encoder applying the error resilient source encoding
12 procedure to the multimedia to produce a bit stream;
13 a channel encoder applying the channel encoding procedure to the
14 bitstream to produce an output signal; and
15 a transmitter applying the particular power level to the output signal
16 for transmission.